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EXAMINER	
BRAYTON, JOHN JOSEPH	
ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,923	YAN, KEPING	
	Examiner	Art Unit	
	John Brayton	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/14/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims Pending

1. Claims 1-17 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2, 10, 11, 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claim 2, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

5. Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 10 and 11 recite an LR circuit, there does not appear to be a definition in the claims or specification as to what L and R pertain to.

6. The term "AC/DC and AC/DC/AC" in claims 13 and 14 is a relative term which renders the claim indefinite. The term "AC/DC or AC/DC/AC" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The Examiner cannot determine whether the AC/DC means

conversion from AC to DC or means an input of AC or DC which is then converted into pulses.

7. Claim 15 provides for the use of a discharge electrode according to claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 15 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Objections

8. Claim 15 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim can depend on more than one other claim only in the alternative . See MPEP § 608.01(n).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 3, 4, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Grass (US 6,282,106).

Regarding claim 1, Grass teaches an apparatus for generating corona discharges, comprising a corona discharge space (electrostatic filter 14);

a discharge electrode disposed in the corona discharge space (14, 15, 17);

as well as a high voltage source (L1, L2, L3,), an output of which is connected to the discharge electrode (15, 17), wherein at least one element having diode functionality (1) is connected between the high voltage source and the discharge electrode, which element delivers a DC high voltage component comprising a superposed AC high voltage component on the discharge electrode (The Examiner takes the position that Grass teaches the high voltage source and diode functionality therefore it must also be capable of performing the function of DC - AC superposition).

Regarding claim 3, Grass teaches an apparatus according to claim 1, wherein the element having diode functionality is configured as a single-phase rectifier. The Examiner takes the position a single phase rectifier requires two diodes back to back, this is indicated by reference number 1 in Figure 1 of Grass.

Regarding claim 4, Grass teaches an apparatus according to claim 1, wherein the element having diode functionality is configured as a bridge rectifier (11, Gratz circuitry, col. 5, ln. 25-30).

Regarding claim 9, Grass teaches the corona discharge space is built up of at least two parallel, electrically earthed plates (15, col. 5, ln. 30-35), between which plates the discharge electrode (17) extends in parallel relationship therewith.

Regarding claim 10, Grass shows a resistor (box) in series with an inductor (coil) directly after L1, L2, L3 in figure 1. Therefore Grass teaches an element having diode functionality is connected in series with an LR-circuit, which LR-circuit is connected to the discharge electrode.

11. Claims 1-3, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Schmidt (US 4,233,039).

Regarding claim 1, Schmidt teaches an apparatus for generating corona discharges, comprising a corona discharge space;

a discharge electrode disposed in the corona discharge space (11);

as well as a high voltage source (R, S, T, 2, 6, 7, 8), an output of which is connected to the discharge electrode (11), wherein at least one element having diode functionality (33, 34, 8) is connected between the high voltage source and the discharge electrode, which element delivers a DC high voltage component comprising a superposed AC high voltage component on the discharge electrode (Abstract, col. 2, ln. 3).

Regarding claim 2, Schmidt teaches an element having diode functionality is a semiconductor, which is configured as a rectifier, a transistor, a diode or a thyristor (33, 34, 8, col. 2)

Regarding claim 3, Schmidt teaches an apparatus according to claim 1 or 2, wherein the element having diode functionality is configured as a single-phase rectifier (8, Fig. 1, col. 2, ln. 30-35).

Regarding claim 13, Schmidt teaches the high voltage source is an AC/DC pulse converter (R,S,T, 2, 31, 32, 35).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 2, 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grass as applied to claim 1 above, in view of Hartmann (US 6,667,875).

Regarding claim 2, Grass teaches an element having diode functionality configured as a rectifier, a transistor, a diode or a thyristor, for example.

Grass does not explicitly teach the element is a semiconductor.

Hartmann teaches a diode is a semiconductor configured as a diode (col. 8, ln. 1-5) because it would be capable or resisting high voltage.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diode of Grass by providing a semiconductor diode because it would be capable of resisting high voltage (col. 8, ln. 1-5).

Regarding claims 5 and 16, Grass teaches an apparatus according to claim 1, wherein the DC high voltage is 110 kV (col. 5, ln. 31).

Grass does not explicitly teach a voltage in the ranges required by Applicant.

Hartmann teaches the DC high voltage is 5-35 kV (col. 4, ln. 56).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the DC high voltage of Grass by providing a DC high voltage in the range of 10-60kV or 5-35 kV, as taught by Hartmann because it would improve the efficiency of the system (col. 2, ln. 45).

15. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grass as applied to claim 10 above, and further in view of Duncan (US 2,838,737).

Regarding claim 11, Grass teaches an inductor L with an induction value, but does not explicitly teach adjustability.

Duncan teaches the induction value L of the LR-circuit is adjustable (col. 1, ln. 55-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the inductor of Grass by providing an adjustable inductor, as taught by Duncan, because it would allow the circuit to be tuned (col. 1, ln. 55-60).

The Examiner takes the position that generally the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA) 1954. MPEP 2144.

Regarding claim 12, Grass teaches an apparatus according to claim 10 comprising an inductor but does not teach an inductance value.

Hartmann teaches an inductance value ranges between 1 nH and 1000 mH (col. 4, ln. 34) because it would improve the efficiency of the system (col. 2, ln. 45).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the inductance value of Grass and Duncan by providing an inductance value ranges between 1 nH and 1000 mH, as taught by Hartmann, because it would improve the efficiency of the system (col. 2, ln. 45).

16. Claims 7, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grass or Schmidt as applied to claim 1 above in view of Galimberti (GB 2014799 as cited on the IDS).

Regarding claims 7 and 8, neither Grass nor Schmidt explicitly teach the discharge electrode is an elongated body having several projecting edges or cams.

Galimberti teaches the discharge electrode is an elongated body having several projecting edges or cams (14, Fig. 6), and wherein said projecting edges extend on either side of said body (Fig. 7, pg. 2, ln. 25-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Grass or Schmidt by providing discharge electrode is an elongated body having several projecting edges or cams, and wherein

said projecting edges extend on either side of said body, as taught by Galimberti, because it would avoid side discharges (pg. 2, ln. 36).

Regarding claim 15, either Grass or Schmidt teach a discharge electrode for use in an apparatus according to claim 1.

Galimberti teaches an electrode as defined in claim 7 or 8.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Grass or Schmidt by providing discharge electrode is an elongated body having several projecting edges or cams, and wherein said projecting edges extend on either side of said body, as taught by Galimberti, because it would avoid side discharges (pg. 2, ln. 36).

17. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grass as applied to claim 10 above, in view of Masuda (US 4,541,848).

Regarding claim 13, Grass does not explicitly teach the high voltage source is an AC/DC pulse converter.

Masuda teaches a high voltage source is a AC/DC pulse converter (col. 3, ln. 20-25).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the high voltage source of Grass by providing a AC/DC pulse converter, as taught by Masuda, because it would allow the power loss in the charging process to be extremely small (col. 3, ln. 27).

18. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt as applied to claim 1 above, in view of Grass (as cited above).

Regarding claim 14, Schmidt does not explicitly teach the high voltage source is an AC/DC/AC converter.

Grass teaches the high voltage source is an AC/DC/AC converter because it would provide controllable power (col. 5, ln. 47-64).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the power supply of Schmidt by providing an AC/DC/AC converter, as taught by Grass because it would provide controllable power.

19. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grass or Schmidt as applied to claim 1 above, in view of Inomata (JP 2001-170441).

Regarding claims 6 and 17, neither Grass nor Schmidt explicitly teach the frequency of the AC high voltage is 0.1-100 kHz or 5-30 kHz.

Inomata teaches the AC high voltage is 0.1-100 kHz or 5-30 kHz.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the frequency of the AC high power of Grass or Schmidt by providing the AC high voltage is 0.1-100 kHz or 5-30 kHz, as taught by Inomata, because it would remove malodorous gas components from air (Derwent Abstract)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Brayton whose telephone number is (571)270-3084. The examiner can normally be reached on 7:30 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

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March 23, 2010